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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,478	08/24/2001	Stefan Scherer	1999 DE 304	8080

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CLARIANT CORPORATION  
INTELLECTUAL PROPERTY DEPARTMENT  
4000 MONROE ROAD  
CHARLOTTE, NC 28205

EXAMINER

ZUCKER, PAUL A

ART UNIT	PAPER NUMBER
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1621

DATE MAILED: 09/30/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Applicati n N .

09/914,478

Applicant(s)

SCHERER ET AL.

Examiner

Paul A. Zucker

Art Unit

1621

-- The MAILING DATE f this c mmunication appears on the c ver sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

## **DETAILED ACTION**

### ***Current Status***

1. This action is responsive to Applicants' amendment of 4 July 2003 in Paper No 13.
2. Receipt and entry of Applicants' amendment is acknowledged.
3. Receipt and entry of Applicants' declaration is acknowledged.
4. Claims 1-10 and 12 remain pending.
5. The objection to the abstract set forth in paragraph 9 of the previous Office Action in Paper No 8 is withdrawn in response to Applicant's amendment.
6. The rejection under 35 USC § 112, second paragraph, set forth in paragraph 10 of the previous Office Action in Paper No 8 is withdrawn in response to Applicant's amendment.

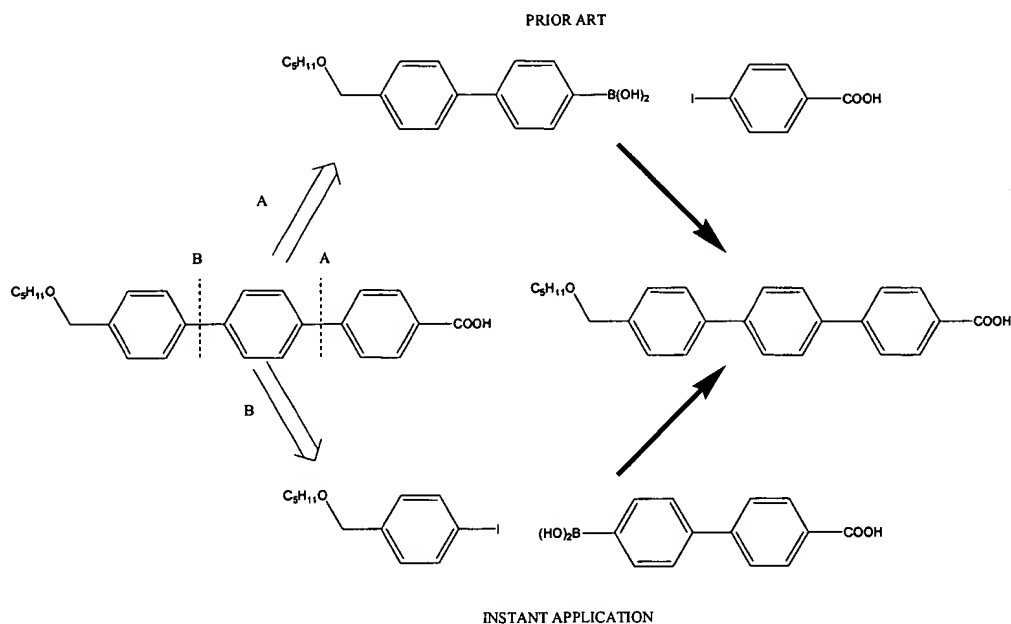
The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1-10 and 12 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Balkovec et al (US 5,948,753 09-1999) and further in view of Miyaura et al (Chemical Reviews 1995, 95, pages 2457-2483) and further in view of Henle et al (US 5,693,611 12-1997).

Instantly claimed is a method for the production of [1,1':4',1'']-terphenyl compounds via the coupling of a biphenyl carboxylic acid derivative bearing a leaving group and a mono-aryl boronate in the presence of a transition metal catalyst.

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Balkovic teaches (Column 19, line 1 - column 20, line 14) a method for the synthesis of 4''-(n-pentyloxy)-[1,1':4',4''-terphenyl]-4-carboxylic acid via the Suzuki coupling reaction according to the figure below.



Balkovic teaches (Column 19, lines 3-25) a process that is defined by retrosynthetic path A above and in the instant case the pathway corresponding to retrosynthetic path B is selected. The chemistry disclosed by Balkovic is the same as that used in the instant case: the palladium-catalyzed Suzuki reaction. Whichever retrosynthetic pathway is followed the same result would be expected and thus the instant process is simply an example of an analogous process which produces the expected result. Balkovic further teaches (Column 19, line 63-column 20, line 14) the reaction of 4-iodobenzoic acid with 4-(4-n-pentyloxyphenyl) boronic acid in ethanol/toluene in the presence of aqueous sodium carbonate and a palladium catalyst at 180 °C. Balkovic further teaches (Column 19, lines 44-61) the synthesis of the boronic acid via the

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reaction of the lithiated biphenyl with triisopropylborate followed by hydrolysis.

Balkovic is silent with regard to the use of borate esters in the coupling reaction although the examiner notes that at 180°C in refluxing toluene in the presence of ethanol (typical esterification conditions) it seems likely that the diethyl borate ester would form under Balkovic's conditions.

The difference between the instantly claimed process and that of Balkovic is that the instant process makes use of organomagnesium compounds to make the borate esters while Balkovic does not.

Miyaura, however, teaches (Page 2458, right column, lines 1-15 and page 2470, equation (76) at bottom left) the use of borate esters (cyclic and acyclic) formed from the corresponding grignard reagents as reactants in the palladium-catalyzed cross coupling reaction to give biaryls. Thus it would have been obvious for one of ordinary skill in the art to have performed the instant invention at the time applicant asserts it was made.

Thus the instantly claimed process would have been obvious to one of ordinary skill in the art. The motivation would have to been to modify the process of Balkovic for the synthesis of an important intermediate required for the synthesis of an antifungal compound (Henle, Column 1, line 1 – column 2 lines 65) using the readily available boronic acid also disclosed by Henle (Column 14, lines 30-49). The expectation for success would have been high based upon its reliance on the proven chemistry developed for the analogous prior art process.

***Examiner's Response to Applicant's Arguments with Regard to This Rejection***

8. Applicant have neither put forth new arguments nor responded to the Examiner's Response as set forth in paragraph 8 of the previous Office Action in Paper No 10.

***Declaration***

9. The Declaration under 37 CFR 1.132 filed 30 January 2003 is insufficient to overcome the rejection of claims 1-10 and 12 based upon Balkovec et al (US 5,948,753 09-1999) as set forth above because of the following reasons:
- a. The Examiner disagrees that Declarant has made a satisfactory showing over Balkovic. In particular, the Examiner points to two differences between Declarant's comparative Example and Balkovic:
    - i. The scale of Declarants' experiment reproducing the process of Balkovic is 25 times that of Balkovic. Conducting a process on a larger scale may introduce engineering problems such as difficulties in mass and heat transfer. This introduces a problem with regard to the scope of the showing since Declarant's showing is not commensurate in scope with Balkovic.
    - ii. The second difference, however, is of a nature that renders Declarant's showing unpersuasive. Declarant's Comparative Example 2 (Declaration, bridging pages 3 and 4) employs 21.8 grams of 4-iodobenzoic acid. Based upon Balkovic's teaching (Column 19, line 63- column 20, line 10) of the use of 0.0874 mL of

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4-iodobenzoic acid, Declarant's showing should employ  $25 \times 0.0874 = 2.185$  mL of 4-iodobenzoic acid. Converting units to grams using the density (Handbook of Chemistry and Physics, 70<sup>th</sup> edition, 1989, CRC Press, Florida, page C-133, 3<sup>rd</sup> entry) of 4-iodobenzoic acid of 2.184 g/mL, the amount of 4-iodobenzoic acid should be:  $2.185 \text{ mL} \times 2.184 \text{ g/mL} = 4.772 \text{ g}$  4-iodobenzoic acid. Declarant has therefore employed ( $21.8 \text{ g} / 4.772 \text{ g} = 4.57$ ) a 4.6-fold excess of 4-iodobenzoic acid over that employed by Balkovic. Declarant's showing does not, therefore, provide the side-by-side comparison required to overcome Balkovic.

Applicant's declaration filed 30 January 2003 has been fully considered but is not persuasive from the reasons indicated above.

### ***Conclusion***

10. Claims 1-10 and 12 are pending. Claims 1-10 and 12 are finally rejected.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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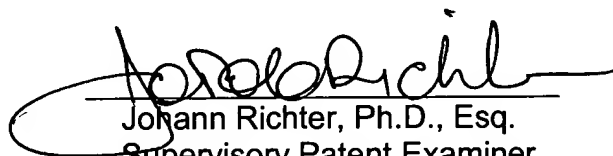
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 703-306-0512. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 703-308-4532. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.

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